

**Receiving a message from work after working hours: Always a bad thing?**

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Aniek Gerkes (5722071)  
Utrecht University  
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Supervisor: prof. dr. Toon Taris  
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**Abstract**

This study examined the influence of receiving a work-related message outside working hours on recovery, measured through burnout and well-being. Further, the influence of several characteristics of these messages – necessity, action encouragement, and valence – on several outcomes - feelings of appreciation, feelings of commitment, and emotion - was examined. A questionnaire was used to collect data among 115 Dutch participants between 20 and 64 years old. No significant correlations were found between the actual number of messages received and burnout and well-being. However, several significant relations were found between the message characteristics and outcomes; messages with a positive content and messages that were considered necessary tended to be associated with positive outcomes, such as feelings of commitment, positive emotion, and the feeling of being appreciated. Based on this study, it appears that receiving many messages after work might not be such a bad thing, as long as characteristics of the message such as necessity and valence are taken into account. Research on this topic is limited, and therefore future research on this topic is recommended.

**Key words:** Work-related messages, Recovery, Burnout, Well-being, Necessity

## Introduction

Life without a smartphone is for most people hard to imagine. Just look around when you walk down the street, and you will see people with their smartphones everywhere. Listening to music, shopping online, playing games, looking up everything you want to know on the internet, watching Netflix, calling and of course texting: a smartphone can be useful in all kinds of ways. But is it really that amazing to be available 24/7? What about calls, texts and e-mails from work? Do you have to answer them even when you are not at work, and how does it make you feel to receive a message from your boss after working hours? The right to be unavailable for work outside working hours has been a topic for some time in several countries in Europe. In France, a law was accepted stating that employees have the right to be unavailable and a law like this is also topic of public debate in the Netherlands (NOS, 2019a). But is it really a bad thing to receive work-related messages outside working hours? Can it influence the recovery process after work negatively, or do some messages actually have a positive effect? In this master thesis the influence of receiving work-related messages outside working hours – and the message characteristics and outcomes – on recovery through burnout and well-being will be researched.

## Effort-Recovery theory

According to the Effort-Recovery theory by Meijman and Mulder (1998), as cited by van Hooff, Geurts, Beckers, and Kompier (2011), work has two outcomes. The first outcome is the service you give or the product you make at work. The second outcome is a load reaction: work takes up resources, as you have to make an effort in order to do your work. In the short term this usually leads to fatigue, but according to the ER theory you can recover from this by for example taking a rest and having a good night of sleep, in other words replenishing the used resources which in result enables you to work again the next day (van Hooff, Geurts, Kompier, and Taris, 2007; Rook and Zijlstra, 2006). The process of ‘charging the batteries’ to be ready for the next day of work is called the *recovery process* (Zijlstra and Sonnentag, 2006). The recovery process - “rest and recuperation occurring during nonwork time” (Sonnentag, 2018a, p. 2) – can occur during work breaks or after work (de Jonge, 2020). Recovery as an outcome entails the return to the physiological and psychological state one was in before being exposed to stressors (Craig and Cooper, 1992; Geurts and Sonnentag, 2006). However, in several circumstances it can be that the recovery process is not fully sufficient and you are still fatigued when starting work the next day. This can cause long-term health problems to occur (van Hooff et al., 2007). Load reactions can be caused by the

experience of stress. Experiencing stress is a consequence of working, caused by so-called job stressors like job demands, which are defined as “aspects of the job that require sustained physical or mental effort and are therefore associated with certain physiological and psychological costs” (Demerouti, Bakker, Nachreiner, and Schaufeli, 2001, p. 501). Over a longer period of time, these job demands can set a stress process in motion: job demands can cause strain which can lead to burnout, which can lead to negative outcomes such as poor performance (Schaufeli, 2017).

### **The nature of recovery**

Recovery is important for both short term and long term outcomes. Recovery enables you to be ready for the next day of work, it prevents serious health consequences such as burnout (Zijlstra and Sonnentag, 2006), and it has a positive effect on work engagement (Sonnentag, 2003). Most research on organizational processes focusses on recovery as a process; “leisure activities and nonwork experiences that lead to a change in physiological and psychological strain levels” (Sonnentag, 2018a, p. 3). There are different kinds of activities that enable someone to rest and thus recover. These activities are those with different demands than work activities and thus use different resources than those which are used for work activities (Zijlstra and Sonnentag, 2006). Sonnentag (2018a) provided four core findings from recovery research and sources of empirical evidence. According to these findings, the core concepts that contribute to recovery are relaxation, experiencing mastery, experiencing control, and physical activities. Moreover, these findings state that recovery practices can be learned and that stressful work makes it more difficult to recover. Recovery as a process can be examined through both what people do – activities – and what psychological state – experiences – people are in (Sonnentag, Venz, and Casper, 2017; Sonnentag, 2018b). Recovery practices related to enhanced well-being are physical exercise, good sleep, and psychological detachment (Sonnentag, 2018b). Research suggests that the type of activity done as recovery practice matters, for some activities have a positive impact and some have a negative impact on recovery. Low-effort activities, social activities and physical activities are positively related to well-being before going to sleep, while job-related and other task-related activities have been shown to have a negative impact on an individual’s well-being before going to sleep (Sonnentag, 2001).

### **Mobile technology and recovery**

Receiving a work-related message on your smartphone outside working hours seems to be an often occurring phenomenon. In 2019, the Dutch news broadcaster NOS mentioned a survey conducted by CBS (Centraal Bureau voor Statistiek) and TNO (Nederlandse Organisatie voor Toegepast-natuurwetenschappelijk Onderzoek) investigating online accessibility among employees outside working hours (NOS, 2019b). They found that almost half of all working people in the Netherlands are accessible via online media for work outside working hours. Technological connectedness with work may have a negative side, by affecting the recovery process. Technology does not only enable employees to be connected with the job outside working hours, it also influences the definition of working hours and therefore can influence the employees' work-life balance (de Jonge, 2020; Zijlstra and Sonnentag, 2006). Technology provides the possibility to connect to work while at home which blurs the line between work and home (Boswell and Olson-Buchanon, 2007). Being available 24/7 can enhance work pressure and stress, which can increase, among other health risks, burnout (de Jonge, 2020). Research already suggests that the quality of sleep may suffer from late-night use of smartphones for work (Lanaj, Johnson, and Barnes, 2014). Sleep problems can have a serious negative impact on recovery, for sleep is very important in the recovery process (Zijlstra and Sonnentag, 2006).

One element that can influence the quality of sleep is when people have difficulties to switch off from work because they are thinking about, for example, problems at work (Zijlstra and Sonnentag, 2006). The use of smartphones for work can make it even more difficult to stop thinking about work problems. Research has shown that there is a negative effect on individuals' well-being when someone engages in work-related activities before going to sleep, which might negatively influence recovery (Sonnentag, 2001). Some discussion can be found in research on the causal relation between sleep and well-being, but overall it can be said that good sleep can decrease the risk of low well-being (Sonnentag, 2018b).

The use of smartphones for work can thus influence well-being via influencing sleep and influencing the recovery process, but as of yet not much additional research on the effects of the use of smartphones for work has been done. When one thinks about recovery, using your smartphone for work outside work hours could be seen as overtime and therefore not as a recovery-enhancing activity. Sonnentag (2001) already mentioned the short-term negative effects using technologies (such as mobile phones and electronic mail) for work while at home can have on cognitive detachment and thus on recovery processes, and that further

research should examine whether there might be negative long-term effects as well (Sonnentag, 2001).

Sonnentag (2018a) also provided a table on the recovery challenges and possible solutions. One of the challenges concerns always being technically connected to the job; “Always-on life” (Sonnentag, 2018a, p. 13), because you read your email on your smartphone outside working hours or for example text with coworkers. As a consequence, being online 24/7 is a way of staying mentally connected to the job for employees, and organizational policies developed to prevent this will not solve the problem, for employees will find another way to stay mentally connected with their job, which can be positive, for this might contribute to their feeling of belonging in the organization. Moreover, it may provide a sense of relief to respond to a message in order to stop worrying about it or its content. Another positive side of using your smartphone to work from home is that it may facilitate being more connected with work (Lanaj et al., 2014).

### **Message characteristics and outcomes**

So it seems that being available for work outside working hours on an online device can have both negative and positive consequences. It is conceivable that there are certain characteristics of the message which play a role in how the receiver perceives the message: positive or negative.

#### *Characteristics*

The negative or positive influence of receiving a message outside working hours can depend on many different characteristics of this message. This study focuses on the characteristics *action encouragement*, *necessity*, and *valence*.

**Action encouragement** Receiving work-related messages outside working hours asks for extra effort from the receiver during non-working time. This effort negatively interferes with the recovery process and can even be seen as working overtime. This negative effect gets stronger when more effort is required, which is the case *action encouragement* increases, because it takes more effort to handle more work-related action. Effort without sufficient recovery can lead to long-term health problems (van Hooff et al., 2007). Therefore, *action encouragement* is included in this study.

**Necessity** The receiver of a message may consider one message more necessary than another. High-necessity messages will on average also require more effort from the receiver than other messages, as high-necessity messages are generally sent only when action has to be

taken or an effort has to be made to deal with this message. Therefore, *necessity* has been included in this study.

**Valence** Research suggests that the way people approach an activity may also influence whether it enhances recovery (Sonnentag, Mojza, Binnewies, and Scholl, 2008). Therefore, one could say the valence of the message can influence the effect it has on the recovery process. Receiving a work email outside working hours may have a negative influence, while receiving an email about your soccer practice may not. Several items on the Negative Acts Questionnaire-Revised (NAQ-R) by Einarsen, Hoel, and Notelaers (2009), which is often used in exploring workplace bullying, can be linked to receiving messages outside working hours which are perceived as negative by the receiver. For example, '*constant reminders of errors or mistakes*', '*excessive monitoring*', '*exposure to an unmanageable workload*', and '*persistent criticism of work*'. Research has shown that workplace bullying has a negative effect on psychological well-being, job satisfaction and organizational commitment (Nielsen and Einarsen, 2012). Also, research has shown that in most situations people are more sensitive to negative information, and negative information has a bigger effect on them than positive information; this phenomenon has been named the *negativity bias* (Ito, Larsen, Smith, and Cacioppo, 1998; Rozin and Royzman, 2001). Thus, *valence* has been included in this study to see whether work-related messages received outside working hours judged as negative, indeed have negative outcomes, and whether messages judged as positive, might have positive outcomes.

#### *Outcomes*

Apart from the possible negative effects of receiving a work-related message outside working hours, positive outcomes can also be thought of. Receiving such a message may have a positive impact on *feelings of affective commitment*, because if someone thought it necessary to send you a message concerning work outside working hours, they apparently thought of you (and considered you important) when dealing with a work-related issue. It also may have a positive impact on *feelings of appreciation*, for similar reasons; the sender of the message wants – or even needs – your help or input. These feelings of commitment and appreciation can positively impact *emotion*: it can make you happy to feel committed and appreciated. Also, your emotions may be affected negatively when you perceive the message as unnecessary, negative, and encourages you to undertake action for work outside working hours.

## **The present study**

The present study will address the following main research question:

*What is the influence of receiving work-related messages outside working hours on recovery, measured through burnout and well-being, and what role do certain perceived characteristics of these messages play?*

The main research question is divided in two sub questions.

Sub question 1:

*What is the influence of receiving work-related messages outside working hours on burnout and well-being and therefore on recovery?*

The following hypotheses were formulated concerning sub question 1:

*H1: The more work-related messages one receives outside working hours, the higher the score on burnout*

*H2: The more work-related messages one receives outside working hours, the lower the score on well-being*

Sub question 2:

*What is the influence of certain perceived message characteristics (necessity, valence, and action encouragement) on certain outcomes (feelings of appreciation, feelings of affective commitment, and emotion)?*

The following hypotheses were formulated concerning sub question 2:

*H3: perceived message characteristics (necessity, valence, and action encouragement) influence the feelings of appreciation the receiver of the message experiences.*

*H4: perceived message characteristics (necessity, valence, and action encouragement) influence the feelings of affective commitment the receiver of the message experiences.*

*H5: perceived message characteristics (necessity, valence, and action encouragement) influence the emotion the receiver of the message experiences.*



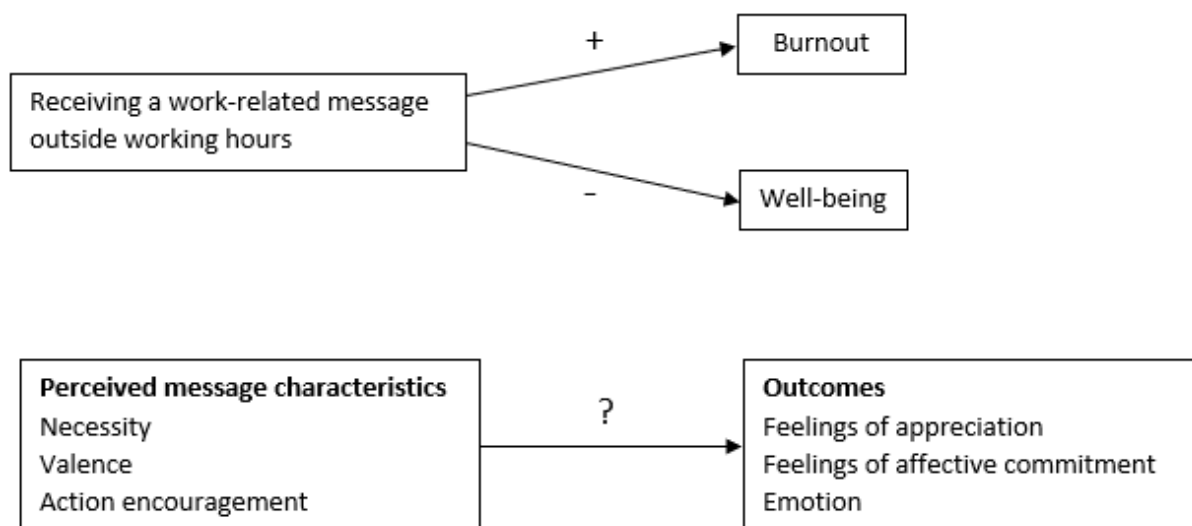


Figure 1 proposed model on research question and hypotheses

## Method

### *Respondents and data collection*

**Recruiting respondents** The present study aimed to recruit Dutch participants who are 18 years or older, with a job and a smartphone who work in different sectors. The respondents were recruited by the distribution of a questionnaire created with Qualtrics. The link to the questionnaire was posted on Social Media including LinkedIn and Facebook. The questionnaire was also distributed in the researcher’s personal network. A message was posted in Dutch, giving a short summary of what the study entails and that it would take up approximately 10 minutes of their time. In the message a link to the questionnaire was given. When clicking on the link, an informed consent form was shown. In this form, the respondent was told in summary what the study entails, that the questionnaire is anonymous and that all the data will be treated confidentially. The respondents were also informed that they were free to stop filling in the questionnaire at any time. After reading this, the respondents could choose to continue or not. Then, to establish whether the respondents met the criteria, they were asked what their year of birth was and whether they had a smartphone and/or a job. Because of distributing the questionnaire in my personal network as well, there was a possibility that a few of the respondents were under 18 years old. All participants below 18 years old, and/or without a job and/or smartphone, were directly directed to the last page of the questionnaire.

**Questionnaire** The respondents who met the criteria, first answered some questions on ‘general person characteristics’. Then, they answered the question whether they had

received a work-related message outside working hours in the last month. If not, they were directed to the questions on ‘well-being’, and ‘burnout’. If so, they were asked to first answer the questions on ‘message characteristics and outcomes’ and then answer the questions on well-being’, and ‘burnout’.

**Deleted respondents** In total, data from 186 respondents were obtained. In total, 4 respondents declared to have a date of birth after 2001. After deleting these respondents, the dataset showed 25 respondents who declared to be currently unemployed. They were also deleted from the dataset. Four respondents who declared not to have a smartphone were also deleted from the dataset, resulting in a sample of 153 respondents.

The dataset showed several respondents who did not answer the questions measuring burnout and well-being, possibly due to a technical error in Qualtrics. All respondents with no answers on burnout and well-being were deleted from the dataset, resulting in 115 recorded responses in the dataset.

**General characteristics respondents** Of the 115 respondents used in this study, 27 are male, 87 are female, and 1 respondent identified as ‘other’. The age range is between 20 and 64 years old ( $M = 37$ ,  $SD = 14$ ). The educational levels of the respondents are distributed as followed: 19 respondents completed *HAVO/MBO*, 7 respondents completed *VWO*, 40 respondents completed *HBO*, and 49 respondents completed *WO*. The respondents mostly work in the sectors *government* (31 respondents), *education* (20 respondents), and *health and well-being* (18 respondents). 92 of the respondents reported that they sometimes sent work-related messages outside working hours themselves, and 38 respondents reported they have a separate work phone. Most of the respondents worked between 33 and 40 hours per week (33 respondents) or between 25 and 32 hours per week (21 respondents) ( $M = 31$ ,  $SD = 11$ ). 109 of the respondents reported to have received a work-related message outside working hours in the past four weeks at the time of filling in the questionnaire, while only 3 participants reported they had not. The respondents reported to have received between 0 and 1500 work-related messages in the past four weeks ( $M = 61$ ,  $SD = 177$ ). However, most of the respondents (49.6%) received between 1 and 20 messages.

### *Measures*

Data was collected using a questionnaire on general characteristics, characteristics of the message, work-engagement/well-being, burnout, and recovery. The full questionnaire is presented in Appendix A. The questions concerning *necessity*, *valence*, *action encouragement*, *feelings of affective commitment*, *feelings of appreciation*, *emotion*, *well-*

*being*, and *burnout* were analyzed with *Principal Component Factor Analysis* (PCA) and a reliability analysis.

**General characteristics** The general characteristics that were collected are age, gender, level of education, sector of work, working hours per week in contract, and actual working hours per week. Respondents were also asked whether they had a work phone, whether they ever send work-related messages outside working hours themselves, and on what level they see themselves in their organization. Also, respondents were asked to estimate the number of work-related messages they received outside working hours in the last four weeks.

**Message characteristics and outcomes** The items measuring the characteristics of the message were designed for this study.

*Necessity* was measured using 3 self-constructed statements such as '*it was necessary to send me this message outside working hours*', measured with a 4 point scale (1 = do not agree at all, 4 = fully agree). A factor analysis of these 3 items showed one component with an eigenvalue above 1, explaining 72% of the variance. A reliability analysis of these 3 items measured a Cronbach's alpha of .80.

*Valence* was measured using 4 self-constructed statements such as '*the message gave me a good feeling*', measured with a 4 point scale (1 = do not agree at all, 4 = fully agree). After recoding 2 items into 1 = fully agree and 4 = do not agree at all, a factor analysis of these 4 items showed one component with an eigenvalue above 1, explaining 49% of the variance. A reliability analysis of these 4 items measured a Cronbach's alpha of .65.

*Action encouragement* was measured using 4 statements such as '*because of the message, I carried out work-related activities outside working hours*', measured with a 4 point scale (1 = do not agree at all, 4 = fully agree). A factor analysis of these 4 items showed one component with an eigenvalue above 1, explaining 62% of the variance. A reliability analysis of these 3 items measured a Cronbach's alpha of .79.

*Feelings of appreciation* were measured using 2 statements such as '*because of the message I felt important*', measured with a 4 point scale (1 = do not agree at all, 4 = fully agree). A factor analysis of these 2 items showed one component with an eigenvalue above 1, explaining 83% of the variance. A reliability analysis of these 3 items measured a Cronbach's alpha of .79.

The items measuring the outcomes of the message were partly designed for this study and partly based on existing questionnaires. *Feelings of affective commitment* were measured using 3 items based on the Affective Commitment Scale (Allen & Meyer, 1990), defining

affective commitment as “identification with involvement in, and emotional attachment to the organization” (Allen and Meyer, 1996, p. 253). An example of an item used is *‘the message made me feel part of the organization’*. Again, a 4-point scale (1 = do not agree at all, 4 = fully agree) was used. A factor analysis of these 3 items showed one component with an eigenvalue above 1, explaining 77% of the variance. A reliability analysis of these 3 items resulted in a Cronbach’s alpha of .85.

The positive and negative affect (PANAS) scale (Watson, Clark, and Tellegen, 1988) was used to measure which *emotion* the respondent felt when receiving their last work-related message outside working hours. 20 emotions such as *‘enthusiastic’* and *‘scared’* were mentioned and the participants could indicate to what extent a certain emotion applies on a 5 point scale (1 = not or barely applicable, 5 = very much applicable). After recoding 10 items into 1 = very much applicable and 5 = not or barely applicable, a factor analysis of these 20 items showed four component with an eigenvalue above 1, explaining 31%, 24%, 7%, and 5% of the variance, respectively. A reliability analysis of these 20 items resulted in a Cronbach’s alpha of .86.

**Recovery** To measure if someone was recovered, the data collected by the work-engagement/well-being scale and the burnout scale were used. A high score on well-being and a low score on burnout will be interpreted as signifying a high level of recovery.

**Work-engagement/well-being** In order to measure well-being, the short version of the Utrecht Work Engagement Scale (UBES, Schaufeli and Bakker, 2003) was used. 9 statements such as *‘I am proud of the work that I do’*, and *‘My work inspires me’* were measured on a 7 point scale (0 = never, 6 = always/daily). These 9 statements measure three subdimensions of well-being, *vigor*, *dedication*, and *absorption*. A factor analysis of these 9 items showed one component with an eigenvalue above 1, explaining 69% of the variance. A reliability analysis of these 9 items measured a Cronbach’s alpha of .94.

**Burnout** In order to measure burnout, the scale ‘Burnout Schaal Centraal Bureau Voor de Statistiek’ (2019a) was used. This scale measures burnout via 5 statements, for example *‘I am emotionally exhausted by my work’*, and *‘At the end of a working day I feel empty’*. The answer categories range from 0 = *never* to 6 = *every day*. A factor analysis of these 5 items showed one component with an eigenvalue above 1, explaining 64% of the variance. A reliability analysis of these 5 items measured a Cronbach’s alpha of .85.

*Statistical analytics*

**Missing values** At first, the dataset was prepared in order to conduct statistical analyses. As described before, several respondents were deleted from the dataset. However, there were still some missing values in the dataset. Some of them were supposed to be missing, because respondents who reported not to have received a message from work outside working hours in the past four weeks, did not answer the questions about this message but were let directly to the burnout and well-being questions. These missing values were coded as 999. The missing values that were not supposed to be missing were coded 666. This way, the missing values would not influence the statistical analyses.

**Correlation analysis** Hypothesis 1 concerning the relation between the number of received work-related messages outside working hours and the score on burnout was tested using a *correlation analysis*. Hypothesis 2 concerning the relation between the amount of received work-related messages outside working hours and the score on well-being was also tested using a *correlation analysis*.

**Multiple regression analysis** Hypothesis 3 concerning the influence of perceived message characteristics (necessity, valence, and action encouragement) on feelings of appreciation – beyond the variance accounted for by background variables - was tested using a *multiple regression analysis*.

Hypothesis 4 concerning the influence of perceived message characteristics (necessity, valence, and action encouragement) on feelings of affective commitment – beyond the variance accounted for by background variables - was tested using a *multiple regression analysis*.

Hypothesis 5 concerning the influence of perceived message characteristics (necessity, valence, and action encouragement) on emotion – beyond the variance accounted for by background variables - was tested using a *multiple regression analysis*.

All analysis were tested with the use of *Statistical Program for Social Sciences* (SPSS).

**Results**

**MANOVA** First, a multivariate analysis of variance (MANOVA) was used to compare the scores on burnout and well-being with whether a participant had received work-related messages outside working hours as the independent variable. The respondents were divided into two groups: those who did receive work-related messages outside working hours, ‘receiver’ ( $n = 106$ ) and those who did not, ‘non-receiver’ ( $n = 3$ ). Findings showed a significant effect of the receiver/non-receiver variable (receiving messages versus not

receiving messages) on the variable burnout,  $F(2,109) = 5.47, p = .021$ , partial  $\eta^2 = .04$ . There was no significant effect of the receiver/non-receiver variable (receiving messages versus not receiving messages) on the variable well-being,  $F(2,109) = .125, p = .725$ , partial  $\eta^2 = .001$ .

Because of the very small  $n$  of the non-receiver group, normality in the distribution of variables could not be expected. Therefore, the results of the MANOVA are not very reliable.

**Correlation** To assess the size and direction of the linear relationship between burnout scores and the number of received messages, a bivariate Pearson's product-moment correlation coefficient ( $r$ ) was calculated. Descriptive statistics of and correlations between the important variables of this study are displayed in table 1. The bivariate correlation between these two variables was positive but weak and not significant,  $r(103) = .08, p = .41$ . Therefore, hypothesis 1 can not be accepted.

To assess the size and direction of the linear relationship between well-being scores and the number of received messages, again a bivariate Pearson's product-moment correlation coefficient ( $r$ ) was calculated. Again, the bivariate correlation between these two variables was positive but weak and not significant,  $r(103) = .01, p = .90$ . Therefore, hypothesis 2 could not be accepted.

**Table 1**  
*Descriptive Statistics and Correlations for Study Variables*

Variable	n	M	SD	1	2	3	4	5	6	7	8	9
1. Burnout	112	13.38	6.16	—	-.44**	.08	0.21*	-.33**	-.44**	.21*	-.04	-.26**
2. Well-being	112	41.04	9.69	-.44**	—	.01	.40**	.46**	.52**	.08	.14	.18
3. NMR	108	35.80	48.18	.08	.01	—	-.09	.01	.12	.21*	.02	.01
4. Appreciation	109	4.61	1.40	-.21*	.40**	-.09	—	.58**	.40**	.14	.18	.36**
5. Commitment	109	7.95	1.95	-.33**	.46**	.01	.58**	—	.53**	.11	.17	.35**
6. Emotion	109	65.54	9.66	-.44**	.52**	.12	.40**	.53**	—	.12	.14	.35**
7. Act. enc.	109	10.98	2.62	.21*	.08	.21*	.14	.11	.12	—	-.02	.10
8. Valence	109	8.36	1.32	-.04	.14	.02	.18	.17	.14	.14	—	-.03
9. Necessity	109	8.34	2.07	-.26**	.18	.01	.36**	.35**	.35**	.10	-.03	—

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

NMR = Number of Messages Received.

**Multiple regression** To test whether the number of received messages accounts for a significant proportion of the variance in burnout, beyond that already accounted for by background variables, multiple regression analysis (MRA) was employed. Statistical results are shown in table 2.

In block 1 of the MRA, background variables accounted for 17.8% of the variance in burnout ( $R^2 = .178$ ). This proportion of variance was statistically significant,  $F(8,92) = 2.498$ ,  $p = .017$ . In block 2, number of received messages was entered into the regression model, increasing  $R^2$  from .178 to .184 (an *R-Square Change* of .006). Number of received messages accounted for an additional 0.6% of the variability in burnout. This increase in  $R^2$  was significant,  $F(9,91) = 2.285$ ,  $p = .023$ . Number of received messages had no significant effect on burnout,  $\beta = .084$ ,  $t = .812$ ,  $p = .419$ .

To test whether the number of received messages can account for a significant proportion of the variance in well-being, beyond that already accounted for by background variables, multiple regression analysis (MRA) was employed. Statistical results are shown in table 2.

In block 1 of the MRA, background variables accounted for 17.8% of the variance in well-being ( $R^2 = .178$ ). This proportion of variance was statistically significant,  $F(8,92) = 2.485$ ,  $p = .017$ . In block 2, the number of received messages was entered into the regression model, increasing  $R^2$  from .178 to .183 (an *R-Square Change* of .005). Number of received messages accounted for an additional 0.5% of the variability in well-being. This increase in  $R^2$  was significant,  $F(9,91) = 2.263$ ,  $p = .025$ . Number of received messages had no significant effect on well-being,  $\beta = -.079$ ,  $t = -.760$ ,  $p = .449$ .

*Message-level analyses.* To test the hypothesis that action encouragement, valence, and necessity can account for a significant proportion of the variance in *appreciation*, beyond that already accounted for by background variables, multiple regression analysis (MRA) was employed. Statistical results are shown in table 3.

In block 1 of the MRA, background variables accounted for 4.1% of the variance in appreciation ( $R^2 = .041$ ). This proportion of variance was not statistically significant,  $F(8,96) = .508$ ,  $p = .488$ . In block 2, action encouragement, valence, and necessity were entered into the regression model, increasing  $R^2$  from .041 to .219 (an *R-Square Change* of .126). Action encouragement, valence, and necessity together accounted for an additional 12.6% of the variability in appreciation. This increase in  $R^2$  was significant,  $F(11,93) = 2.366$ ,  $p = .013$ . Action encouragement had no significant effect on appreciation,  $\beta = .008$ ,  $t = .074$ ,  $p = .941$ . Valence did have a positive significant effect on appreciation,  $\beta = .209$ ,  $t = 2.172$ ,  $p =$



.032. Necessity also had a positive significant effect on appreciation,  $\beta = .275$ ,  $t = 4.095$ ,  $p < .005$ . Therefore, hypothesis 3 can be accepted, noting that the influence of action encouragement was not significant.

To test the hypothesis that action encouragement, valence, and necessity can account for a significant proportion of the variance in *affective commitment*, beyond that already accounted for by background variables, multiple regression analysis (MRA) was employed. Statistical results are shown in table 3.

In block 1 of the MRA, background variables accounted for 7.3% of the variance in affective commitment ( $R^2 = .073$ ). This proportion of variance was not statistically significant,  $F(8,96) = .943$ ,  $p = .485$ . In block 2, action encouragement, valence, and necessity were entered into the regression model, increasing  $R^2$  from .073 to .207 (an *R-Square Change* of .113). Action encouragement, valence, and necessity together accounted for an additional 11.3% of the variability in affective commitment. This increase in  $R^2$  was significant,  $F(11,93) = 2.203$ ,  $p = .020$ . Action encouragement had no significant effect on affective commitment,  $\beta = .081$ ,  $t = .786$ ,  $p = .434$ . Valence also did not have a significant effect on affective commitment,  $\beta = .176$ ,  $t = 1.817$ ,  $p = .072$ . Finally, Necessity did have a positive significant effect on affective commitment,  $\beta = .334$ ,  $t = 3.312$ ,  $p < .005$ . Therefore, hypothesis 4 was accepted, noting that in particular the influence of necessity was significant.

To test the hypothesis that action encouragement, valence, and necessity can account for a significant proportion of the variance in *emotion*, beyond that already accounted for by background variables, multiple regression analysis (MRA) was employed. Statistical results are shown in table 3.

In block 1 of the MRA, background variables accounted for 18.2% of the variance in emotion ( $R^2 = .182$ ). This proportion of variance was statistically significant,  $F(8,96) = 2.669$ ,  $p = .011$ . In block 2, action encouragement, valence, and necessity were entered into the regression model, increasing  $R^2$  from .182 to .304 (an *R-Square Change* of .222). Action encouragement, valence, and necessity together accounted for an additional 22.2% of the variability in emotion. This increase in  $R^2$  was significant,  $F(11,93) = 3.691$ ,  $p < .001$ . Action encouragement had no significant effect on emotion,  $\beta = .032$ ,  $t = .331$ ,  $p = .741$ . Valence also did not have a significant effect on emotion,  $\beta = .129$ ,  $t = 1.421$ ,  $p = .159$ . However, necessity did had a significant positive effect on emotion,  $\beta = .350$ ,  $t = 3.705$ ,  $p < .005$ . Therefore, hypothesis 5 can be accepted, noting that in particular the influence necessity was significant.

**Table 2** Multiple Regressions Burnout and Well-being on Background Variables and Number of Messages Received

	Burnout		Well-being	
	Model 1	Model 2	Model 1	Model 2
	<i>B / beta</i>	<i>B / beta</i>	<i>B / beta</i>	<i>B / beta</i>
Gender	-160 / -.012	.125 / .009	1.624 / .072	1.187 / .052
Educational level	.376 / .067	.309 / .055	-.785 / -.085	-.682 / -.074
Work sector	-.155 / -.078	-.163 / -.082	.265 / .081	.277 / .085
Sending messages	2.250 / .151	2.396 / .161	<b>-7.150 / -.294*</b>	<b>-7.374 / -.303*</b>
Owning work phone	.361 / .029	.404 / .032	-.506 / -.025	-.572 / -.028
age	<b>-.148 / -.352*</b>	<b>-.149 / -.353*</b>	.023 / .034	.024 / .035
Working hours contract	-.839 / -.175	-.632 / -.130	<b>-.847 / -.235*</b>	<b>-2.178 / -.277*</b>
Working hours per week	1.274 / .273	1.174 / .251	3.599 / .471	3.754 / .491
Number of messages received		.011 / .084		-.017 / .022
<i>R</i> <sup>2</sup>	.178	.184	.178	.183
<i>R</i> <sup>2</sup> change		<b>.006*</b>		<b>.005*</b>

Note. **Bold** is significant, \* *p* < .05, \*\* *p* < .01, \*\*\* *p* < .001.

**Table 3** Multiple Regressions *Appreciation, Affective Commitment and Emotion, on Background Variables, Valence, Necessity and Action Encouragement*

	Appreciation		Affective commitment		Emotion	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
	<i>B / beta</i>	<i>B / beta</i>	<i>B / beta</i>	<i>B / beta</i>	<i>B / beta</i>	<i>B / beta</i>
Gender	.045 / .014	.252 / .080	.061 / .014	.267 / .060	-2.205 / -.101	-1.140 / -.052
Educational level	-.046 / -.036	-.032 / -.025	.111 / .062	.117 / .066	.700 / .079	.774 / .087
Work sector	-.013 / -.029	.011 / .025	-.021 / -.034	.008 / .013	.319 / .103	.451 / .146
Sending messages	-.439 / -.124	-.589 / -.166	.002 / .000	-.108 / -.022	-3.822 / -.154	-4.372 / -.177
Owning work phone	-.293 / -.102	-.086 / -.030	.201 / .049	.475 / .117	.142 / .007	1.238 / .062
age	-.005 / -.051	-.012 / -.125	<b>.033 / .249*</b>	.026 / .196	<b>.213 / .321***</b>	<b>.173 / .260*</b>
Working hours contract	.184 / .176	.157 / .150	.463 / .315	.489 / .332	.956 / .131	.927 / .128
Working hours per week	-.182 / -.180	-.034 / -.034	-.558 / -.391	-.459 / -.321	-.814 / -.115	-.063 / -.009
Valence		<b>.215 / .209*</b>		.256 / .176		.927 / .129
Necessity		<b>.275 / .410**</b>		<b>.316 / .334***</b>		<b>1.636 / .350***</b>
Action encouragement		.004 / .008		.061 / .081		.118 / .032
R <sup>2</sup>	.041	.219	.073	.207	<b>.182*</b>	.304
R <sup>2</sup> change		<b>.126*</b>		<b>.113*</b>		<b>.222***</b>

Note. **Bold** is significant, \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

## Discussion

The results of this study suggest a possible relation between the number of messages received and burnout. However, this relation is weak and not reliable due to the very small  $n$  of the non-receiver group. Also, no significant relation was found between number of messages received and well-being. Therefore, the first sub question - *what is the influence of receiving work-related messages outside working hours on burnout and well-being and therefore on recovery* – can be answered by concluding that no significant influence of receiving work-related messages, nor the amount of received messages, on recovery was found in this study. This finding is somewhat unexpected, for the negative influence of receiving work-related message outside working hours on general well-being seems to be an accepted fact in that organizations are already developing policies concerning the right of being unavailable outside working hours (NOS, 2019c). Media refers to an American study conducted in 2016, which found a negative relation between time spent on work email outside working hours and emotional exhaustion. They also found a relation between the organizations expectation on monitoring work email and emotional exhaustion (Belkin, Becker, & Conroy, 2016). Also, the way the organizational policies regarding monitoring work email make the employees feel seems to be of importance, since an effect on emotional exhaustion is found regardless of the actual time spent on monitoring work email (Belkin et al., 2016).

It might be that receiving the message and the number of received messages does not really matter, where content and characteristics of the message might actually be of more importance. This study looked into 3 message characteristics and 3 possible outcomes, in order to answer the second sub question: *What is the influence of certain perceived message characteristics (necessity, valence, and action encouragement) on certain outcomes (feelings of appreciation, feelings of affective commitment, and emotion)*. Results show that necessity, valence, and action encouragement all influence feelings of appreciation, feelings of affective commitment, and emotion. Especially necessity seems to be of significant importance, for all of these outcomes. The more the receiver perceives the message to be necessary, the more they feel appreciated, committed to their work, and the more positive emotions they report. These outcomes can be related to an increase in well-being. Research has shown a significant relation between affective commitment and employee well-being (Panaccio and Vandenberghe, 2009).

However, when the message is perceived as unnecessary, this can lead to a decrease in feelings of appreciation, commitment and more negative emotions. Therefore, the

characteristics or content of these messages might also increase burnout, decrease well-being and thus influence the recovery process. The effect of unnecessary messages with a negative content that make you feel bad and unappreciated can be compared to that of receiving workplace bullying messages, which has a negative effect on well-being, job satisfaction, and organizational commitment (Nielsen and Einarsen, 2012).

However, when reasoning that the characteristics and content of the message can be responsible for negative outcomes, this can also mean that these characteristics and content can be responsible for positive effects, for characteristics and content can be influenced. Research already showed that smartphone use at home for work can facilitate being more connected with work (Lanaj et al., 2014). By influencing characteristics and content, receiving work-related messages outside working hours may even contribute to the general well-being of employees by making them feel more happy, committed, and appreciated.

### **Study limitations**

Three main limitations of the present study need to be discussed.

**Cross-sectional** This is a cross-sectional study, which can be seen as a limitation for several reasons. First of all, the data collected is only a snapshot. Results may differ when data is collected in a different timeframe (Levin, 2006). Second, a cross-sectional design makes it difficult to identify causality in relations between variables (Levin, 2006). Thus, it would be desirable to replicate the present study using a longer, longitudinal time frame.

**Self-report data** The data used in this study was self-reported. This also can be a limitation for several reasons. The respondents may not answer honestly due to embarrassment, exaggeration, or because they give social desirable answers. However, the anonymous nature of this study may have decreased the possibility of giving dishonest answers.

**Nature of sample** The data was collecting using a convenience sample approach. At the time of data collection, the COVID-19 virus obligated staying at home as much as possible, therefore, the questionnaire could not be distributed on paper in public places, distribution was limited to using Social Media and the researcher's own network. People who are active on Social Media might also be more active in sending and receiving messages, which could explain why the group of people who do not receive work-related messages outside working hours had such a small *n* of 3. Also, by distributing the questionnaire at public places this study could have included more respondents in total. Therefore the nature of the sample can be seen as a limitation of this study.

**Focus on last message** In this study, data was collected concerning the last message respondents received. Therefore, the effect of receiving many such messages on the outcomes *feelings of appreciation, feelings of commitment, and emotion* could not be tested. Yet it is conceivable that this is relevant: it would seem possible that participants who receive many messages that bring about feelings of appreciation and commitment and positive emotions, will ultimately experience better well-being than others.

### **Study implications**

The results of this study suggest that the characteristics of the message received can influence how the receiver feels. For future research, it is recommended to look into the effect of a larger range of characteristics on a wider range of outcomes. The message characteristics may show negative effects, as mentioned in the media, but might also suggest positive effects which enables outside work hours messages to contribute to employees general well-being. Also, for future research it is recommended to look into what it is that makes the receiver perceive the message as necessary, since necessity seems to be such an important characteristic of the message.

Based on this study it can not be stated that, even though a large percentage of working people receive work-related messages outside working hours, receiving messages causes problems regarding burnout and recovery. However, this may be caused by the fact that the sample of this study is small and possibly biased. Practically this implicates that there is as yet no need to undertake serious action in preventing employers or supervisors from sending of work-related messages outside working hours to their employees. However, the sender should consider the necessity of the message before sending it: receivers do not mind it if the message is necessary and might even appreciate the message, but receiving irrelevant messages is associated with adverse outcomes.

### **Conclusion**

Where extensive research has been conducted on the topic of recovery, little is known about the influence smartphone use can have on this. Being available for work outside working hours has become a topic of interest in politics, and media seem to assume negative consequences attached to this availability. This study made a first effort in researching the possible effect of the number of work-related messages received after working hours might have on recovery, and also attempted to research what characteristics of such messages influence people in their commitment, emotion, and perceived appreciation. Based on this

study, it seems that receiving the message itself is not always a bad thing: it is the characteristics such as necessity and valence that matter.

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## **Appendix A: Questionnaires**

### **Algemene persoonskenmerken**

- Leeftijd

*Wat is uw geboortejaar?*

- Man/Vrouw/Overig

- Hoogst afgeronde opleidingsniveau

*(Als uw opleiding er niet bij staat, kruis dan de opleiding aan die het meest op de door u gevolgde opleiding lijkt)*

*Lagere school*

*MAVO, LBO, VMBO*

*HAVO, MBO*

*VWO*

*HBO*

*WO*

- Niveau. A.d.h.v. een ladder, waar op de ladder zien zij zichzelf staan binnen de organisatie?

- Sector

*In welke sector van de arbeidsmarkt werkt u?*

*Industrie*

*Bouw*

*Handel*

*Horeca*

*Vervoer*

*Financiële instelling*

*Zakelijke dienstverlening*

*Communicatie*

*Overheid*

*Onderwijs*

*Gezondheidszorg en welzijnswerk*

*Cultuur en vrije tijd*

*Agrarische sector*

*Anders, namelijk ...*

- Hoeveel uur werken per week

*Wat is de omvang van uw aanstelling in uren per week volgens uw contract?*

*Hoeveel uren werkt u feitelijk gemiddeld per week?*

- Zelf versturen van werk-gerelateerde berichten buiten werktijd

*Stuurt u zelf weleens werk-gerelateerde berichten naar uw collega's buiten werktijd?*

- Werktelefoon

*Heeft u een aparte werktelefoon?*

### **Karakteristieken van het bericht**

- Frequentie van het ontvangen van berichten

*Hoe vaak heeft u de afgelopen vier weken een werk gerelateerd bericht buiten werktijd ontvangen?*

Gemeten door middel van stellingen:

- Ervaren noodzaak (van het meest recent ontvangen bericht)

- a. *Het was nodig om mij dit bericht buiten werktijd te sturen*
  - b. *Ik begrijp waarom dit bericht buiten werktijd is gestuurd*
  - c. *Als ik de verzender was, had ik dit bericht ook buiten werktijd gestuurd*
- (Schaal, 1 = helemaal niet me eens, 2= niet mee eens, 3 = eens, 4 = helemaal mee eens)

- Positieve/negatieve inhoud bericht

- a. *Het bericht was positief van aard (bijv. een compliment of een bedankje)*
  - b. *Het bericht was negatief van aard (bijv. benadrukken wat je verkeerd hebt gedaan)*
  - c. *Het bericht gaf me een goed gevoel*
  - d. *Het bericht gaf me een slecht gevoel*
- (Schaal, 1 = helemaal niet me eens, 2= niet mee eens, 3 = eens, 4 = helemaal mee eens)

- Aanzetten tot actie

- a. *Het bericht moedigde me aan om na te denken over werk gerelateerde zaken buiten werktijd*
  - b. *Het bericht moedigde me aan om werk gerelateerde activiteiten uit te voeren buiten werktijd*
  - c. *Door het bericht heb ik over werk gerelateerde zaken nagedacht buiten werktijd*
  - d. *Door het bericht heb ik werk gerelateerde activiteiten uitgevoerd buiten werktijd*
- (Schaal, 1 = helemaal niet me eens, 2= niet mee eens, 3 = eens, 4 = helemaal mee eens)

- Affectieve betrokkenheid

Gebaseerd op de Affective Commitment Scale van Allen & Meyer (1990). Met als definitie van affectieve betrokkenheid 'identification with, involvement in, and emotional attachment to the organization' (Allen & Meyer, 1996, p. 253).

- a. *Het bericht gaf me een gevoel van emotionele verbondenheid met de organisatie.*
  - b. *Het bericht gaf me een gevoel dat ik bij de organisatie hoor.*
  - c. *Het bericht gaf me het gevoel 'deel van de familie' te zijn van de organisatie.*
- (Schaal, 1 = helemaal niet me eens, 2= niet mee eens, 3 = eens, 4 = helemaal mee eens)

- Waardering

- a. *Door het bericht voelde ik me belangrijk*
  - b. *Het bericht gaf me het gevoel dat ik gewaardeerd wordt door mijn collega's*
- (Schaal, 1 = helemaal niet me eens, 2= niet mee eens, 3 = eens, 4 = helemaal mee eens)

- Algemeen

- a. *Ik vind het niet erg om werk gerelateerde berichten te ontvangen buiten werktijd*
  - b. *Ik vind het niet fijn om werk gerelateerde berichten te ontvangen buiten werktijd*
  - c. *Het ontvangen van werk gerelateerde berichten buiten werktijd hoort bij mijn werk*
  - d. *Ik voel me vrij om werk gerelateerde berichten die ik ontvang buiten werktijd te negeren*
  - e. *Ik voel me verplicht om te reageren/actie te ondernemen na het ontvangen van werk gerelateerde berichten buiten werktijd*
- (Schaal, 1 = helemaal niet me eens, 2= niet mee eens, 3 = eens, 4 = helemaal mee eens)

- Emotie

Positive and negative effect (PANAS) scale (Watson, Clark, & Tellegen (1988).

Deze schaal wordt gebruikt om vast te stellen welke emotie de participant voelt bij de werk

gerelateerde berichten die hij of zij heeft ontvangen buiten werktijd in de afgelopen vier weken.

Deze schaal bestaat uit een aantal woorden die gevoelens en emoties beschrijven. Lees elk woord en kruis dan aan in welke mate dit gevoel op u van toepassing was gedurende toen u deze boodschap ontving.

	niet of nauwelijks van toepassing	enigszins van toepassing	redelijk van toepassing	sterk van toepassing	zeer sterk van toepassing
1. Geïnteresseerd*	①	②	③	④	⑤
2. Gespannen	①	②	③	④	⑤
3. Opgewonden*	①	②	③	④	⑤
4. Van de kaart	①	②	③	④	⑤
5. Krachtig*	①	②	③	④	⑤
6. Schuldig	①	②	③	④	⑤
7. Angstig	①	②	③	④	⑤
8. Vijandig	①	②	③	④	⑤
9. Enthousiast*	①	②	③	④	⑤
10. Trots*	①	②	③	④	⑤
11. Geïrriteerd	①	②	③	④	⑤
12. Alert*	①	②	③	④	⑤
13. Beschaamd	①	②	③	④	⑤
14. Geïnspireerd*	①	②	③	④	⑤
15. Nerveus	①	②	③	④	⑤
16. Vastbesloten*	①	②	③	④	⑤
17. Aandachtig*	①	②	③	④	⑤
18. Zenuwachtig	①	②	③	④	⑤
19. Actief*	①	②	③	④	⑤
20. Bang	①	②	③	④	⑤

### Work-engagement/well-being

Utrecht Work Engagement Scale (UBES) verkorte versie (Schaufeli & Bakker, 2003).

	<i>nooit</i>				<i>altijd</i>			
1. Op mijn werk bruis ik van energie (V*)	①	②	③	④	⑤	⑥	⑦	⑧
4. Als ik werk voel ik me fit en sterk (V*)	①	②	③	④	⑤	⑥	⑦	⑧
5. Ik ben enthousiast over mijn baan (D*)	①	②	③	④	⑤	⑥	⑦	⑧
7. Mijn werk inspireert mij (D*)	①	②	③	④	⑤	⑥	⑦	⑧
8. Als ik 's morgens opsta heb ik zin om aan het werk te gaan (V*)	①	②	③	④	⑤	⑥	⑦	⑧
9. Wanneer ik heel intensief aan het werk, ben voel ik mij gelukkig (A*)	①	②	③	④	⑤	⑥	⑦	⑧
10. Ik ben trots op het werk dat ik doe (D*)	①	②	③	④	⑤	⑥	⑦	⑧
11. Ik ga helemaal op in mijn werk (A*)	①	②	③	④	⑤	⑥	⑦	⑧

14. Mijn werk brengt mij in vervoering (A\*)      ①   ②   ③   ④   ⑤   ⑥

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0 = Nooit, 1 = sporadisch/een paar keer per jaar of minder, 2 = af en toe/eens per maand of minder, 3 = regelmatig/een paar keer per maand, 4 = dikwijls/eens per week, 5 = zeer dikwijls/een paar keer per week, 6 = altijd/dagelijks

Subschalen: V = vitaliteit, A = absorptie, D = dedication/toewijding.

\* = item is onderdeel van verkorte versie.

### **Burnout**

Burnout schaal Centraal Bureau Voor de Statistiek (2019a):

Burnout gedefinieerd als: opgebrandheid door het werk die zich kenmerkt door gevoelens van vermoeidheid en uitputting. Dit wordt gemeten aan de hand van vijf uitspraken:

- a. *Ik voel me emotioneel uitgeput door mijn werk.*
- b. *Aan het einde van een werkdag voel ik me leeg.*
- c. *Ik voel me moe als ik 's morgens opsta en geconfronteerd word met mijn werk.*
- d. *Het vergt heel veel van mij om de hele dag met mensen te werken.*
- e. *Ik voel me compleet uitgeput door mijn werk.*

De antwoordmogelijkheden hierbij zijn: nooit, enkele keren per jaar, maandelijks, enkele keren per maand, wekelijks, enkele keren per week of elke dag. Als iemand gemiddeld op de vijf uitspraken enkele keren per maand of vaker antwoordt, dan worden deze gevoelens van vermoeidheid en uitputting aangemerkt als burnout klachten.

### **Recovery**

To measure if someone is recovered, the data collected by the work-engagement/well-being scale and the burnout scale will be used. A high score of well-being and a low score of burnout will be interpreted as having high score of recovery.